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Vol. VI, No. 47.] BULLETIN OF THE TORREY BOTANICAL CLUB. [New York, Nov., 1878.

§ 270. Some Rambling Notes on Collecting and Preserving Herbarium Specimens.

VI. **Drying Specimens,** *continued.*—Although plants, can, if necessary, be kept quite fresh for several days in portfolio or vasculum, it will be found a good plan, on returning from a collecting trip, to transfer them to the home press as early as possible. If left too long in box, many specimens will lose their petals or other delicate parts, and if left too long in portfolio, abundance of moisture will accumulate in the papers from the plants, and after a while fermentation set in, and then, if not quickly attended to, the specimens will be soon entirely ruined. No alarm need be felt at the presence of the moisture, except that an excessive amount is an indication of early fermentation. This may be arrested, if on a several day,s' trip from home, by taking out the sheets with specimens, as soon as they begin heating, and exposing them a few minutes to the open air and sun.

In putting plants in the specimen sheets, whether in portfolio or press, it is well to take some pains to spread out the leaves, flowers, etc., of the specimen ; for a little care now shown may save considerable labor further on. However, with most species any carelessness in this respect can be remedied at first time changing ; yet there are some plants referred to in second paper of these notes, as, *Caulophyllum*, the *Thalictrums*, many of the *Cruciferae* and *Leguminosae*, and others, which are so delicate that whatever straightening out and arranging they receive must be done at the time they are first put in, for after that the sheets have usually to remain closed until the specimens are quite cured.

Plants which were put directly into press should receive special attention at *first change* of driers. The first change is the most important of all, so far as the arrangement of the specimen is concerned. Particular care should be taken at *this time* to straighten out and remove all folds and doublings-up in the leaves, petals, fronds, etc., and to arrange the specimens as naturally as possible, —showing both sides of the flowers and leaves. Small pieces of bibulous paper may be placed at this time between leaves and other parts of the plant which overlap each other, to prevent their moulding or discoloring, and to hasten drying. Formerly I believed it necessary to change these fragments for dry ones with every change of driers, but, if the latter are changed frequently, I find they may remain, with perhaps a change the first or second day, until the plants are cured, with no detriment to the specimens. For very succulent plants, they should be changed with driers.

The first change of driers should be made within several hours ; rarely should it be deferred longer than 10 or 12 hours from the time of putting into press. If put off longer than this, the specimens of many species become too dry to make readily the alterations required. For this initiatory pressing a lighter weight—25 lbs. for instance—and fewer driers may be used, as the chief aim is merely to overcome that stubborn rigidity and elasticity, so troublesome in specimens when first put in the sheets, by rendering them sufficiently flaccid for every part to stay in the position arranged. The final arrangement of those plants collected in portfolio should be made while transferring to the home press, as they will then be found sufficiently collapsed to be managed easily. For picking at the leaves and flowers in arranging specimens, there is nothing much better than a quill tooth-pick.

After the specimens have been arranged and the driers changed, they should be returned to the press and a heavier weight placed upon them. Some writers advise pressing lightly at first and gradually increasing the pressure, but my experience is in favor of quite the opposite course. As soon as the specimens have been put in order, I find it best to place the plants at once under strong pressure—as heavy as they are to receive at any time. In the case of the Sedges and Grasses very little pressure should be used; from 10 to 25 lbs., is amply sufficient.

To have specimens retain their *naturalness* in color, form and appearance, we repeat, they should be dried as rapidly as possible, and the best way to secure this result is by *frequent changing* of the driers. The driers should be changed at least once a day for the first four or five days, and afterwards every other day until the specimens are cured,—which in most plants will be in about a week. While *good* specimens can be made by this treatment, I would recommend changing oftener for the first day or two, as thereby a marked improvement will be gained. The first day with Grasses, Sedges and their allies, and the first two days with most other plants, are of more importance in drying than all the subsequent time. As an acute botanist pertinently remarks: "Two or even three changes of the driers during the first 24 hours will accomplish more than a dozen changes after the lapse of several days. The most perfect preservation of the beautiful colors of some Orchids which I have ever seen was effected by heating the driers and changing them every two hours during the first day."

The using of heated driers I have found a very efficient aid in my plant drying. I employ them whenever possible in my work, and, as a factor in making fine specimens, changing with *heated driers* should be placed next in value to *frequent* changing. This heating is very simple. Spread the damp driers out in the sunshine, and when dry bring them in hot and make changes at once. It is surprising to see what a marked effect these heated driers have upon fresh or stubborn specimens, and how quickly they cause them to yield to their potent influence. Of course driers heated by the fire or by flat-irons answer equally the same purpose.

The period required to dry specimens varies with different species and with the season; it will depend also on the frequency of the changes and the temperature of the driers. The time is usually from four days to a week, while a few plants require even longer. But with two changes a day for the first day or two and heated driers the specimens may be dried in fully half their usual time, and in better condition. Consequently, it will be seen that the special attention recommended during their early period in drying does not, in the aggregate, make any additional labor, but rather less, for by it the plants are much sooner dried.

One of the most difficult of American plants that have come under my experience, outside of the "*Live-for-ever*" family and their neighbors, is *Liparis lilifolia*. This plant has frequently kept me *squeezing* away at it for several weeks (when not using heated driers) but I have generally succeeded in making it retain its natural color at last. With warm driers the colors may be retained of nearly all the Orchidaceous and Liliaceous groups, the Baptisias, the Gerardias (I fail with *G. flava*) and many other plants which become discolored in drying.

If the leaves of thick, fleshy plants are immersed for a few moments in hot water, it will hasten their period of desiccation, although they often turn dark in pressing as a consequence of the immersion. Many of the endogenous plants and others, if desirable, may be ironed in their driers with gratifying success. Some botanists recommend putting fleshy endogens and other succulent plants in a separate press near the stove, where they claim plants may be dried in a few days. For these plants the writer prefers using heated driers.

Small plants may be handsomely dried in old books. If only a few specimens are placed in the book, they may be dried without once shifting. Not a heavy pressure should be used. On removal of plants, dry the book for again using, by spreading open in the sunshine, or hanging on a line near the fire.

It may sometimes be convenient to dry certain plants by placing them in a suitable vessel and covering (sifting) with warm dry sand. In a day or two they will be found nearly free from moisture, when, if expedient, they may be transferred to the press.

Viscous plants and those likely to adhere to the sheets enclosing them may have Lycopodium, powdered soapstone, or some similar substance sprinkled over them to prevent their sticking. In the absence of any of these powders I have used fine white sand with fair success.

In changing the driers of the plants, place the package to be changed at left hand on the table or counter, the new pile in front of the sitter, with its length parallel, a position the most favorable for giving any needed attention in arranging specimens, while the fresh driers may be placed at right hand, or beyond the pile in front. Thus arranged, the sheets of specimens can be rapidly shifted into their fresh driers.

The driers and packets may be dried in several ways. The packets may be hung on a line in a warm room, or in the open air when not too windy ; the driers, after the dew has disappeared, may be spread on the grass. A better way, for the latter, if you have the room, is first to lay down in a sunny place a covering of old boards, sticks, brush, or anything to keep them from the ground. A favorite place with the writer, on a still day, is on the top of a flattish tin-roof, where, exposed to a fierce radiating heat on one side and the direct rays of the sun on the other, the driers and packets dry perfectly in a few minutes.

Always spread your moist driers in the sunshine when possible, and then at longest they will dry within an hour, unless put out too late in the day. Do not leave them too late in the day, as the dew falls early in the shade. Take them up while hot, even if not to be immediately used, as much heat will still be found in a pile of driers at evening changes.

During cloudy weather, it may be necessary to dry both packets and driers in the house. If no better way present itself, the latter will have to be spread about the room. Some botanists make a hole in each end of drier or packet and string them on a stout wire or rod, suspended on hooks set in the wall or a shelf. The writer has arranged a kind of rack for the driers, which he places near the fire.

I shall close this paper with a recapitulation of a few of the more important hints on good drying.

Select the most bibulous paper for driers.

Use specimen sheets to enclose plants in drying.

Do not make the piles too large.

The first change of driers should be made within several hours after putting into press;

Then remove all folds and arrange specimen naturally.

Change driers twice a day for a day or two.

Use heated driers when possible.

§ 271. **Two remarkable forms of Trillium.**—Mr. Darius R. Shoop has sent us from St. Louis, Michigan, two remarkable forms, as I take them to be, of *Trillium grandiflorum*. Both show certain marks of abnormality in the stripe of green down the centre of the petals, although in one of them it is slight. One of these specimens is a slender *T. grandiflorum* with leaves petioled in the manner of *T. nivale*. Mr. Shoop took it for a large form of the latter species, and the leaves are quite as much petioled; but they have the cuneate base and the conspicuously acuminate apex of *T. grandiflorum*; and the flower is just like that of this species with partly chlorosed petals, such as are occasionally met with.

The other specimen, which Mr. Shoop would like to have named *T. aphyllum*, is most remarkable. The stem, as we take it to be, though the base is not given, is six inches long, and bears a fine large flower and nothing else. The sepals are rather more foliaceous than is usual, and are fully two inches long, quite equalling the petals. There is no doubt of its being a sport. But both these freaks should be watched, and all the forms found growing with them likewise gathered. A. GRAY.

§ 272. **North-eastern Plants.**—Mr. C. G. Pringle, Charlotte, Vermont, sends his list of "Alpine and rarer Northern Plants" with several additions, and the following note. These plants he offers for exchange for good herbarium specimens, or selected specimens for sale, labelled, and carriage prepaid, at 10 cents a specimen. The testimony to the excellence of his specimens we have heretofore given:

At the close of another season I am able to report a few finds which may be of more or less interest.

Sisymbrium canescens, Nutt. Cliffs, shore of Lake Champlain, near Westport, N. Y.

Halenia deflexa, Griseb. In low woods on a river bank, Charlotte, Vt.